AIAM
INTERNATIONAL ADVANCED SCHOOL IN AGRICULTURAL METEOROLOGY

FIRST EDITION

AGRICULTURAL METEOROLOGY FOR A CLIMATE SMART AGRICULTURE

CO-ORGANIZED BY WORLD METEOROLOGICAL ORGANIZATION

WITH THE SUPPORT OF

Alliance
Bioversity International
CIAT International Center for Tropical Agriculture

GACSA
GLOBAL ALLIANCE FOR CLIMATE-SMART AGRICULTURE

CGIAR
RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security
CCAFS

Fondazione Clima e Sostenibilità

Consiglio Nazionale delle Ricerche
Istituto per la BioEconomia

Accademia dei Georgofili

crea
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

RETE RURALE NAZIONALE 2014 2020

ccrs Center for Corporate Responsibility and Sustainability
at the University of Zurich

esa

UNIVERSITÀ DEGLI STUDI FIRENZE
DAGRI
DIPARTIMENTO DI SCIENZE E TECNOLOGIE AGRARIE ALIMENTARI, AMBIENTALI E FORESTALI

MINISTERO DELL'AMBIENTE E DELLA TUTELA DEL TERRITORIO E DEL MARE

Since its foundation in 1997, AIAM has been involved in enhancing and promoting agrometeorological research through conferences, seminars, and training courses. It also acts as a link between the services and research activities. This connection has the result of promoting researches on relevant agrometeorological themes, which are internationally disseminated through the Italian Journal of Agrometeorology.

As part of its mission, **AIAM is proud to launch the First Edition of the International Advanced School in Agricultural Meteorology**, aiming to build up knowledge about the use of integrated tools and advanced technologies for a sustainable management of agroecosystems.

The 2021 edition, co-organized with WMO-RTC and FAO, is focused on the role of Agricultural Meteorology for a Climate Smart Agriculture (CSA), and wants to provide young researchers and professionals with high-level innovative knowledge and skills on the most advanced technologies for the agrometeorological analysis and monitoring applied to a sustainable agricultural development under climate change.

Course Content

In order to facilitate participants to increase their knowledge on **how Agricultural Meteorology can contribute to a Climate Smart Agriculture, the school will include theoretical activity and practical sessions to allow the direct application of theoretical concepts**. The active participation of the trainees is necessary to facilitate the realization of an interdisciplinary partnership among technicians and scientists.

A large spectrum of topics will be covered by the course:

- **Climate Smart Agriculture concept and the 5 step-process to CSA implementation**

- **Eddy Covariance and flux measurement techniques in the agricultural ecosystem: briefing on theory, experimental design and implementation**

- **Climate information Services, Early Warning Systems and Early Action**

- **European Space Agency (ESA) facilities and tools: Copernicus, databases, instruments/tools**

- **Extreme events, risk reduction**

- **Index based insurance**

- **Climate Change, Agriculture, and Food Security**

Trainers are world-class experts from acknowledged **Universities, Research Institutions, International Agencies, as well as, Food and Agriculture Organization of United Nations - FAO, European Space Agency ESA**.

Scientific coordinators for AIAM

Filiberto Altobelli, Anna Dalla Marta, Federica Rossi, Francesca Ventura

Scientific committee

Filiberto Altobelli (CREA-PB), Anna Dalla Marta (University of Florence-DAGRI), Federica Rossi and Marina Baldi (CNR-IBE and WMO-RTC), Federica Matteoli (FAO)

Organization committee

AIAM, National Research Council (**CNR**), Council for Agricultural Research and Economics (**CREA**), Food and Agriculture Organization (**FAO**), World Meteorological Organization - Regional Training Center (**WMO-RTC**), Rete Rurale Nazionale (**RRN**), Italian Ministry for Environment, Land and Sea Protection, European Space Agency (**ESA**), Foundation for Climate and Sustainability (**FCS**), Global Alliance for Climate-Smart Agriculture (**GACSA**), **Alliance-Bioversity – CIAT**. University of Florence (**DAGRI**), University of Zurich (**CCRS**).

Course Format

Two-week virtual classroom school, which includes lectures, group discussions, case studies and practical training sessions. Students and teachers of the course will benefit from the Moodle platform through which educational material will be shared and assessment procedures conducted.

Date and Time

From **Monday 08 March** 2021 14:00 to **Friday 19 March** 2021 18:00

Costs

A registration fee of 300€ will be charged to all participants, to be paid before the beginning of the School via Internet banking. Tuition fee includes course material

Monday, 8

Opening Session

Welcome
Course introduction and overview

Session 1 (4h) - Climate Smart Agriculture

The session will focus on the Climate Smart Agriculture - CSA approach and CSA pillars. Specifically, **the session will include challenges and opportunities for agriculture in the face of climate change**; CSA concept and 5 step-process to CSA implementation; practices and production systems for CSA; tools and Methods for Evidence-based Decision Making in CSA.

Tuesday, 9

Session 2 (4h) - Climate information Services

The session will be organized into two parts. A first session, which includes a series of lectures to be delivered **by experts of FAO, will cover various aspects of climate services value chain in the agricultural sector**. A second session will aim to provide practical experiences/tools how to translate climate knowledge into climate action on the ground. **More specifically, climate information services; delivery of climate information services to end-users; Early Warning Systems and Early Action, hands-on activities will be delivered.**

Wednesday, 10

Sessions 2-bis (4h) - Climate information Services

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Thursday, 11

Session 3 (4h) - Copernicus, databases, instruments/tools

European Space Agency's experts will illustrate New Capabilities in Earth Observation to support a sustainable Agriculture with reduced environmental impact and increased climate resilience by responding to global, regional and local needs for: mapping and monitoring of crops; supporting and monitoring agricultural practices.

Friday, 12

Pausa

Monday, 15

Session 4 (2h) – How agribusiness and agricultural meteorology can contribute to CSA

Digital agriculture can improve forecasting, diagnosis of pests and diseas¬es, or bundle field and weather information to offer an integrated smart on-field strategy. The customized, real-time, finely tailored intelligent in¬sights gathered can help growers tackle intra-field variability, make intel¬ligent choices on what, when and where to plant, and what to apply. **Agri¬businesses can help farmers adopt digital agriculture practices through consolidation across the food value chain, new cooperative ways of invest¬ing, and modern finance and risk-sharing models**.

Session 5 (2h) – Principles of Climate and Risk Communication

The objective of this session is to present a general introduction on the complexity of climate change communication and the key principles for effective communication on climate change with a special focus on communicating climate change impacts on the agricultural sector. The session includes the presentation of the Training Operational Package for Climate Services – TOPaCS module on communication, and a **practical assignment to be completed by the participants.**

Tuesday, 16

Session 6 (4h) - Flux measurements and remote sensing in agriculture

The session will be divided into four parts. The first part will focus on the **eddy covariance method for measuring ecosystem fluxes of mass and energy**, and will address the theory, the experimental design and implementation, and agricultural and ecological applications. The second part will illustrate **low-cost sensor networks for smart farming**. The third part will provide **an overview on remote sensing of vegetation** to support food security and sustainability, encompassing current state-of-the-art sensors, platforms and approaches for assessment of plant traits and productivity or stress detection. The last part will be **demonstrative**, and will include the visualization of an invisible fluorescence signal and a presentation of Wireless Sensor Networks and drone-based instrumentation for precision agriculture applications.

Wednesday, 17

Session 7 (2h) Climate Risk Profiling

They present key challenges posed by climate change and the impacts it might have on the agricultural sector. They then **suggest specific interven¬tions that could address those challenges and outline financing opportuni¬ties for CSA**. The session will provide students with **an overview on how the profiles are structured, scientific models used to develop them and practi¬cal ways to adopt them in decision making processes**.

Session 8 (2h) – Climate Finance

Meeting the financing requirements for climate-smart agriculture is pivotal to address global food insecurity. The Climate Finance **session aims at illus¬trating the main concepts related to financing mechanisms that aims to in¬crease investments in agriculture sector, while delivering positive climate outcomes, such as increased resilience and reduced emissions intensity**.

Thursday, 18

Session 9 (4h) - Extreme events, risk reduction, Early Warning Systems

The session will include an **introduction to drought and its impacts on agro-ecosystems, a description of an open and interoperable climate service to support user needs for reducing the gap between the drought development and the emergency management**. Attention will be pointed out on what type of information should be produced and how, dealing with concepts of Data Cube, Open Science and FAIR principles. **A practical session will explain how to use the different drought Climate Service tools and integrate its products with other information**.

Friday, 19

Session 10 (1.30h) - Climate Information Services for Agricultural Advisory and its application

The presenter will showcase deployment of different example of climate services for informed agricultural decision making from **Latin America, Africa and South East.**

Session 11 (1.30h) – Practical assignments discussion

During the session results from practical assignments completed by the par-ticipants will be discussed with trainers.

Closing of the school